

Reading Outline 12.1 “Forces”

(pages 356–362)

This section describes what forces are and explains how forces affect the motion of various objects.

Reading Strategy (page 356)

Relating Text and Visuals As you read about forces, look carefully at Figures 2, 3, and 5 in your textbook. Then complete the table by describing the forces and motion shown in each figure. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Forces and Motion

Figure	Is Net Force 0?	Effect on Motion
2A		
2B		
3		
5A		
5B		

What is a Force? (pages 356–357)

1. A force is defined as a(n) _____ or a(n) _____ that acts on an object.
2. Is the following sentence true or false? Explain why or why not.
“A force can act to cause an object at rest to move or it can accelerate an object that is already moving.”
3. How can a force change the motion of an object that is already moving?
4. Circle the letter of the best answer. What force causes a 1-kg mass to accelerate at a rate of 1 meter per second each second?

Name: _____

Per: _____

- a. $1 \text{ kg/m} \cdot \text{s}^2$ b. 1 kg/s
c. $1 \text{ kg} \cdot \text{m}$ d. 1 newton

Combining Forces (pages 357–358)

5. The overall force acting on an object after all the forces are combined is the _____.
6. How do balanced and unbalanced forces affect the motion of an object?

Friction (pages 359–360)

7. Is the following sentence true or false? Explain why or why not.
“Friction is a force that helps objects that are touching move past each other more easily”.
8. Circle the letters that identify types of friction.
a. rolling b. gravity
c. static d. sliding
9. The friction force that acts on objects that are at rest is _____.
10. Why is less force needed to keep an object moving than to start the object in motion?
11. Complete the table below about friction forces.

Types of Friction Forces	
Friction Force	Example
Static	
	Pushing a book along your desk
Rolling	

12. Is the following sentence true or false? Explain why or why not.

Name: _____

Per: _____

“Fluid friction is a force that opposes the motion of an object through a fluid such as water.”

Gravity (page 361)

13. Gravity is a(n) _____ force that pulls objects together.
14. Is the following sentence true or false? Explain why or why not.
“Earth’s gravity acts downward toward the center of Earth.”
15. Describe how gravity and air resistance affect the motion of a falling object.
16. Is the following sentence true or false? Explain why or why not.
“Terminal velocity is the constant velocity of a falling object when the force of air resistance equals the force of gravity.”

Projectile Motion (page 362)

17. The curved path caused by the combination of an initial forward velocity and the downward force of gravity is known as _____ motion.